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luminous than usual. During the preceding eclipses of 1870, July 12, 1877, February 27 and August 23, all of which I observed, our satellite seemed considerably brighter than on the present occasion, and the colouring was more striking. The remarkable opacity of the shadow became evident when it had well encroached upon the Moon's eastern limb, and the fact was fully confirmed by the aspect of her disc during the subsequent stages of the eclipse.

The firmament grew as dark as on an ordinary night when the moon is entirely absent, and but for the indistinct outline of our satellite projected upon the dark background of the sky, there was nothing abnormal in the appearance of the heavens. Small stars could be distinguished with the customary readiness, and the Moon herself, high in the southern sky, looked like a large, ill-defined nebula with indeterminate outlines, or like a planet struggling feebly through very thick haze. Applying my 10-in. Reflector, power 60, her sharply circular contour, however, still admitted of satisfactory observation, and many leading features of the surface were recognised amid the prevailing gloom in which her landscape was involved.

As the Moon emerged from the umbra I believe the depth of the shading was perceptibly less intense than during the immersion. The blue tint so often observed in previous eclipses was distinctly present near the borders of the shadow, while in the more interior region the colouring developed into a dark reddish-brown; but the effect of the different hues and their variations during the progress of this eclipse were far less notable (owing to the extreme darkness of the umbra) than during the similar phenomena of 1870 and 1877 as I remember them.

I took advantage of the dark sky during the Moon's obscuration to examine the comet discovered by Wolf at Heidelberg on September 17. Its position was some 12° E. of the cluster of bright stars in the head of *Delphinus*; the comet was seen as a round nebulosity about 3′ diameter, and with a bright stellar nucleus.

Bristol:
1884, *Oct.* 8.

Abnormal Obscurity of the Moon in the late Eclipse. By the Rev. S. J. Johnson, M.A.

On the evening of October 4 there was a conspicuous return of the sunset after-glow that was common last winter. A peculiar state of the strata of our atmosphere might, therefore, indicate that something unusual was to be expected in the eclipse following.

At 8^h, penumbra barely perceptible with opera-glass.

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At 8^h^ 12^m^, very decided.

8^h^ 18^m^ 5^s^, shadow had reached *Grimaldi*.

At 9^h^ 7^m^, for the first time, a very small portion of the eclipsed disk, extending only 4′ or 5′ inwards, could be discerned through the telescope, this appearing of a dark slate colour—the same tint as is usually observed at the commencement of an eclipse.

At 9^h^ 10^m^, the whole of the lunar circle began to be seen through the telescope, but without a trace of the ordinary coppery redness.

9^h^ 29^m^ 7^s^, reappearance of small star (time by sextant).

10^h^ 2^m^, middle of totality. To the naked eye nothing could be seen but a faint nebulous spot. That the obscurity of the Moon arose from lack of illumination, not from fog or cloud, was seen by the fact that stars of small magnitudes above and below the lunar disk shone as distinctly as on an ordinary dark night. The exact appearance of the Moon at this time would be described by quoting Kepler's words verbatim about the eclipse of June (not December) 1620. "Luna difficillimè apparuit, emicuit tamen instar tenuissimæ nubeculæ, longè debilior quam viâ lacteâ, sine omni rubedine."

10^h^ 8^m^ 21^s^, immersion of very faint star. Uncertain to 3 or 4 seconds.

10^h^ 33^m^ 41^s^, star of magnitude 8½ occulted. Appeared to linger for 4 seconds within the Moon's limb.

10^h^ 39^m^ 28^s^, reappearance of a star.

10^h^ 49^m^ 15^s^, sunlight breaking out.

The shadow left the Moon near the *Mare Fœcunditatis* about 11.48¾, the penumbra being conspicuous to the naked eye at 11.51. Thus, while the Moon did not completely disappear during totality (except to one correspondent), the peculiar features of the eclipse were the complete invisibility of the eclipsed orb until nine-tenths were covered, also subsequent to the total phase after one-tenth was uncovered. In this respect it seems similar to the earliest instance of the kind given in modern times, that observed by Kepler in 1601, an eclipse of nine-tenths of the Moon's disk. His words are (*Astronomiæ pars optica*), "Anno 1601 Decembri, tenuissimo cornu superstite, caliginosam tamen partem non vidi."

The usual explanation, that when the atmosphere is remarkably free from vapour the red rays would be absorbed, is hardly an adequate one.

(1.) Because the atmosphere was in an equal state of dryness on the occasion of the eclipse of July 12, 1870, when the Moon assumed the usual dull red or copper colour.

(2.) Because the last instance of the disappearance of the Moon was on June 10, 1816, when it could not be discerned even with telescopes, and this was one of the wettest summers in the century.

Melplash Vicarage,
Bridport : Oct. 11.

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Observations of Comet 1884 (*Barnard*) *made at the Royal Observatory, Cape of Good Hope.*

(*Communicated by David Gill, LL.D., F.R.S., H.M. Astronomer.*)

The following observations were made with the 7-inch Equatorial and Repsold filar micrometer by Mr. W. H. Finlay, Chief Assistant. The comet was so situated that meridian observations of the comparison stars could always be secured with the transit circle within a few nights after their comparison with the comet. The observations are corrected for the effects of refraction.

The comet throughout presented the appearance of a small diffused nebulous mass. A nucleus was seen by glimpses on July 28, but the bright moonlight on following nights prevented more than an occasional suspicion of its existence. About the end of July the point of greatest condensation (in which the nucleus had been seen) was slightly towards the following part of the mass; this was the point observed. In August the appearance of the comet was reduced by moonlight to a small round mass slightly brighter towards the centre; the centre of this mass was observed. The comet presented a similar appearance in September, and was similarly observed. The comet, as a rule, was faint and difficult to observe in August, probably from its being projected on the Milky Way as a background. An apparent increase of brightness on September 15 and following days was very striking, compared with the appearance of the comet in the end of August.

Observations of Comet Pons-Brooks have been secured on forty-three nights from January 16 to April 29 inclusive, and will be published so soon as the meridian observations of the comparison stars have been completed.

Differences of R.A. and N.P.D. of the Comet and Comparison Stars, observed with the 7-inch Equatorial.

Date.	Cape Mean Time.	Δα ☄ − ✱	No. of Trans.	Δ N.P.D. ☄ − ✱	No. of Bisecs.	Comparison ✱
	h m s	m s		′ ″		
July 24	10 8 8·1	−0 13·0	4	+6 57·1	4	*a*
26	10 38 4·0	+4 30·38	4	−6 29·0	4	*b*
27	10 54 54·1	+0 10·09	16	−1 14·3	16	*c*
28	11 6 15·8	−0 14·11	16	+6 33·3	16	Stone 8897.
29	11 10 32·2	+1 0·99	16	−2 26·8	16	Stone 8913.
30	11 5 15·7	+0 47·41	16	+1 59·5	16	*d*
Aug. 1	10 19 53·3	−0 7·04	10	+1 31·0	6	*e*
5	9 35 49·5	+0 32·05	16	+0 53·5	16	*f*
6	9 53 49·7	+0 30·12	16	+2 18·8	16	*g*
7	10 10 18·4	+0 21·60	16	+1 31·6	16	*h*
8	10 10 5·0	−0 20·07	20	−0 46·7	16	*i*